HOW TO USE:
MATHEMATICS - CONCEPT BY CONCEPT

Written by Larry D. Andrew

Educational Planning & Evaluation Services, Inc.
P. O. Box 689
Magnolia, Arkansas 71753

General Directions: The purpose of this program is to use the computer to generate student worksheets and answer sheets for every basic mathematics concept by addition, subtraction, multiplication, and division. The work activities are excellent for creating or supplementing basal textbooks. Mathematics problems for a specific student or an entire class can be quickly obtained.

Specific instructions for using the computer to generate these problems are given below. Please refer to the Appendix of these instructions which provides information about the program content. This information will be needed and useful in helping you know how to answer specific questions in the instruction.

I. Loading the Program

Instructions: Use the following directions in loading the Mathematics Concepts program into the computer.

Step 1 - Turn printer switch to the off line position. Turn on the printer.

Step 2 - Turn on the computer by using the switch beneath the right hand side of the keyboard.

Step 3 - Turn the printer switch to the on line position.

Step 4 - Insert a system diskette in the bottom disk drive with label up. Be sure to close door on disk.

Step 5 - Insert the Concept by Concept diskette in the top disk drive with label up. Be sure to close door on disk.

Step 6 - Press orange reset button on upper right hand of key board. A picture of the computer will come on the screen.

Step 7 - Type in the date you are using the programs. The format to be followed is month/day/year using number codes. (Do not forget the /.) The codes are as follows:

Month = 01 to 12 (January - December)
Day = 01 to 31
Year = 83

Step 8 - After completing the above, the computer will ask for the time. Then press <ENTER> key.

Step 9 - The computer will display the following: TRSDOS READY. This means the computer is ready to go.

II. Selecting the Program to be Used

Instructions: To tell the computer which mathematics program you want to use, do the following:

Step 1 - If you want the Addition program, type in ADD, then press <ENTER> or

Step 1a- If you want the Subtraction program, type in SUBT, then press <ENTER> or

Step 1b- If you want the Multiplication program, type in MULT, then press the <ENTER> or

Step 1c- If you want the Division program, type in DIV, then press the <ENTER>.

Step 2 - The selected program will then appear on the computer screen and you are now ready to answer specific questions to produce the desired instructional problems.

III. Producing Instructional Problems

Instructions: To obtain a list of instructional problems for the student to work on, you must answer the following questions that will appear on the computer screen.

Question 1 - Which concept do you want?

Instructions: Go to the Appendix and review the content of the program you have selected to determine the type of problems you want printed out for the student to work on. After reviewing the content, answer the question by doing the following:

Step 1 - Type in the number of the concept desired.

Step 2 - Press <ENTER>.

Question 2 - How many problems do you want printed?

Instructions: You must tell the computer how many problems you want printed out. This number must be a multiple of 5. In the addition and subtraction program you may request up to 50 problems on a page. In the multiplication and division problems, you may request up to 30 and 25 problems per page, respectively. Answer the question by doing the following:

Step 1 - Type in the number of problems you want.

Step 2 - Press <ENTER>.

Question 3 - How many copies of the problem do you want printed out?

Instructions: You must tell the computer how many copies of the problems (student exercises) you want printed out. (Remember the computer can print on ditto masters, see question below). Answer the question by doing the following:

Step 1 - Type in the number of copies you want.

Step 2 - Press <ENTER>.

Question 4 - Do you want the computer to pause between pages?

Instructions: You may tell the computer to pause between pages in case you want only one copy. The first copy printed will always be the answer sheet. The next copy(s) will be the student exercises (same problems without the answers). The computer can print on ditto masters. It may be desirable to have the computer print out the problems (student exercises) on a ditto and then copy them on a ditto machine. Answer the question by doing the following:

Step 1 - Type in "Y" if answer is yes or type "N" if answer is no.

Step 2 - Press <ENTER>.

Question 5 - Is the above information correct?

Instructions: At this point you may correct any of the information that you have entered. Answer the question by doing the following:

Step 1 - Type in "Y" if the answer is yes.

Step 1a- Press <ENTER> and the computer will generate the desired problems and print them out.

Step 2 - Type in "N" if the answer is no. If you type "N", the questions will appear again on the computer screen and you may re-answer them again using the correct information.

A P P E N D I X

Program Content

A. Content of Addition Concept Program

The itemized concept sheet for addition contains 63 different concepts. The left hand column identifies the concept. The second column indicates the number of digits in the top number of the addition problem. The third column indicates the number of digits in the bottom number of the addition problem. The next four columns indicate the column(s) in which carrying is used. An "X" in the final column indicates that there is no carrying in the problem. Notice that there is a line drawn across the page when the number of digits in the top and bottom number changes. This divides the different types of problems. The word "combination" indicates that the problems generated are a combination of those concepts which have the indicated number of digits in the top and bottom numbers. For example, concept No. 4 is a combination of all the problems that have one digit in the top number and one digit in the bottom digit.

Addition - Concept by Concept

CONCEPT NO.	NUMBER OF DIGITS TOP	BOT		CARRYING IN COLUMN:* 1's	10's	100's	1000's	NONE
1	1	1	(1-5)					X
2	1	1						X
3	1	1		X				
4	1	1	Combination					
5	2	1						X
6	2	1		X				
7	2	1	Combination					
8	2	2						X
9	2	2		X				
10	2	2			X			
11	2	2		X	X			
12	2	2	Combination					
13	3	1						X
14	3	1		X				
15	3	1	Combination					
16	3	2						X
17	3	2		X				
18	3	2			X			
19	3	2		X	X			
20	3	2	Combination					
21	3	3						X
22	3	3		X				
23	3	3			X			
24	3	3				X		
25	3	3		X	X			
26	3	3		X		X		
27	3	3			X	X		
28	3	3		X	X	X		
29	3	3	Combination					

*The X indicates that there is no carrying.

Addition - Concept by Concept

CONCEPT NO.	NUMBER OF DIGITS TOP	BOT	CARRYING IN COLUMN:* 1's	10's	100's	1000's	NONE
30	4	1					X
31	4	1	X				
32	4	1	Combination				
33	4	2					X
34	4	2	X				
35	4	2		X			
36	4	2	X	X			
37	4	2	Combination				
38	4	3					X
39	4	3	X				
40	4	3		X			
41	4	3			X		
42	4	3	X	X			
43	4	3	X		X		
44	4	3		X	X		
45	4	3	X	X	X		
46	4	3	Combination				
47	4	4					X
48	4	4	X				
49	4	4		X			
50	4	4			X		
51	4	4				X	
52	4	4	X	X			
53	4	4	X		X		
54	4	4	X			X	
55	4	4		X	X		
56	4	4		X		X	
57	4	4			X	X	
58	4	4	X	X	X		
59	4	4	X	X		X	
60	4	4	X		X	X	
61	4	4		X	X	X	
62	4	4	X	X	X	X	
63	4	4	COMBINATION				

*The X indicates that there is no carrying.

B. Content of the Subtraction Concept Program

The itemized concept sheet for subtraction contains 70 different concepts. The left hand column identifies the concept. The second column indicates the number of digits in the top number of subtraction problem. The third column indicates the number of digits in the bottom number of the subtraction problem. The next three columns indicate the column(s) in which borrowing is used. An "X" in the final column indicates that there is no borrowing in the problem. Notice that there is a line drawn across the page when the number of digits in the top and bottom number changes. This divides the different types of problems. The word "combination" indicates that the problems generated are a combination of those concepts which have the indicated number of digits in the top and bottom numbers. For example, concept No. 5 is a combination of all the problems that have two digits in the top number and one digit in the bottom digit.

Subtraction - Concept by Concept

CONCEPT NO.	NUMBER OF DIGITS TOP	BOT		BORROWING FROM COLUMN:* 10's	100's	1000's	NONE
1	1	1	(1-5)				X
2	1	1					X
3	2	1					X
4	2	1		X			
5	2	1	Combination				
6	2	2					X
7	2	2		X			
8	2	2	Combination				
9	3	1					X
10	3	1			X		
11	3	1	Combination				
12	3	2					X
13	3	2		X			
14	3	2			X		
15	3	2		X	X		
16	3	2	Combination				
17	3	3					X
18	3	3		X			
19	3	3			X		
20	3	3		X	X		
21	3	3	Combination				
22	4	1					X
23	4	1		X			
24	4	1	Combination				
25	4	2					X
26	4	2		X			
27	4	2			X		
28	4	2		X	X		
29	4	2	Combination				
30	4	3					X
31	4	3		X			
32	4	3			X		
33	4	3				X	
34	4	3		X	X		
35	4	3		X		X	

*The X indicates that there is no borrowing.

Subtraction - Concept by Concept

CONCEPT NO.	NUMBER OF DIGITS TOP	BOT		BORROWING FROM COLUMN:* 10's	100's	1000's	NONE
36	4	3			X	X	
37	4	3		X	X	X	
38	4	3	Combination				
39	4	4					X
40	4	4		X			
41	4	4			X		
42	4	4				X	
43	4	4		X	X		
44	4	4		X		X	
45	4	4			X	X	
46	4	4		X	X	X	
47	4	4	Combination				
			(Zero's)**				
48	3	1	(10)	X	X		
49	3	2	"	X	X		
50	3	3	"	X	X		
51	4	1	"	X	X		
52	4	2	"	X	X		
53	4	3	"	X	X		
54	4	4	"	X	X		
55	4	2	(100)		X	X	
56	4	3	"		X	X	
57	4	5	"		X	X	
58	4	2	"	X	X		
59	4	3	"	X	X		
60	4	4	"	X	X		
61	4	1	(10/100)	X	X	X	
62	4	2	"	X	X	X	
63	4	3	"	X	X	X	
64	4	4	"	X	X	X	
65	4	3	(1/100)	X	X		
66	4	4	"	X	X		
			(1/10/100)				
67	4	1	"	X	X	X	
68	4	2	"	X	X	X	
69	4	3	"	X	X	X	
70	4	4	"	X	X	X	

*The X indicates that there is no borrowing.
**Indicates column's containing zero's.

C. Content of the Multiplication Concept Program

The itemized concept sheet for multiplication contains 104 different concepts. The left hand column identifies the concept. The second column indicates the number of digits in the top number. The third column indicates the number of digits in the bottom number of the multiplication problem. The next four columns indicate the column(s) in which carrying is used. (Please note that the carrying refers only to the largest place value in the bottom number. The concepts are sequenced from easy to difficult. Therefore, as a student progresses he should know the previous concepts to that point in the sequence.) An "X" in the final column indicates that there is no carrying in the problem. Notice that there is a line drawn across the page when the number of digits in the top and bottom number changes. This divides the different type of problems. The word "combination" indicates that the problems generated are a combination of those concepts which have the indicated number of digits in the top and bottom number. For example, Concept No. 3 is a combination of all the problems that have one digit in the top number and one digit in the bottom digit.

Multiplication - Concept by Concept

CONCEPT NO.	NUMBER OF DIGITS TOP	BOT	CARRYING IN COLUMN:* 1's	10's	100's	1000's	NONE
1	1	1					X
2	1	1	X				X
3	1	1	Combination				
4	2	1					X
5	2	1	X				
6	2	1		X			
7	2	1	X	X			
8	2	1	Combination				
9	2	2					X
10	2	2	X				
11	2	2		X			
12	2	2	X	X			
13	2	2	Combination				
14	3	1					X
15	3	1	X				
16	3	1		X			
17	3	1			X		
18	3	1	X	X			
19	3	1	X		X		
20	3	1		X	X		
21	3	1	X	X	X		
22	3	1	Combination				
23	3	2					X
24	3	2	X				
25	3	2		X			
26	3	2			X		
27	3	2	X	X			
28	3	2	X		X		
29	3	2		X	X		
30	3	2	X	X	X		
31	3	2	Combination				
32	3	3					X
33	3	3	X				
34	3	3		x			
35	3	3			x		

*The X indicates that there is no carrying.

Multiplication - Concept by Concept

CONCEPT NO.	NUMBER OF DIGITS TOP	BOT	CARRYING IN COLUMN:* 1's	10's	100's	1000's	NONE
36	3	3	X	X			
37	3	3	X		X		
38	3	3		X	X		
39	3	3	X	X	X		
40	3	3	Combination				
41	4	1					X
42	4	1	X				
43	4	1		X			
44	4	1			X		
45	4	1				X	
46	4	1	X	X			
47	4	1	X		X		
48	4	1	X			X	
49	4	1	X	X	X		
50	4	1	X	X	X		
51	4	1	X		X	X	
52	4	1		X	X		
53	4	1		X		X	
54	4	1			X	X	
55	4	1	X	X	X	X	
56	4	1	Combination				
57	4	2					X
59	4	2	X				
59	4	2		X			
60	4	2			X		
61	4	2				X	
62	4	2	X	X			
63	4	2	X		X		
64	4	2	X			X	
65	4	2	X	X	X		
66	4	2	X	X	X		
67	4	2	X		X	X	
68	4	2		X	X		
69	4	2		X		X	
70	4	2			X	X	
71	4	2	X	X	X	X	
72	4	2	Combination				

*The X indicates that there is no carrying.

Multiplication - Concept by Concept

CONCEPT NO.	NUMBER OF DIGITS TOP	BOT		CARRYING IN COLUMN:* 1's	10's	100's	1000's	NONE
73	4	3						X
74	4	3		X				
75	4	3			X			
76	4	3				X		
77	4	3					X	
78	4	3		X	X			
79	4	3		X		X		
80	4	3		X			X	
81	4	3		X	X	X		
82	4	3		X	X	X		
83	4	3		X		X	X	
84	4	3			X	X		
85	4	3			X		X	
86	4	3				X	X	
87	4	3		X	X	X	X	
88	4	3	Combination					
89	4	4						X
90	4	4		X				
91	4	4			X			
92	4	4				X		
93	4	4					X	
94	4	4		X	X			
95	4	4		X		X		
95	4	4		X			X	
96	4	4		X			X	
97	4	4		X	X	X		
98	4	4		X	X	X		
99	4	4		X		X	X	
100	4	4			X	X		
101	4	4			X		X	
102	4	4				X	X	
103	4	4		X	X	X	X	
104	4	4	Combination					

*The X indicates that there is no carrying.

D. Content of the Division Concept Program

The itemized concept sheet for division contains 30 different concepts. The left hand column identifies the concept. The second column indicates the number of digits in the divisor. The third column indicates the number of digits in the dividend. The fourth column indicates the number of digits in the quotient. The fifth and sixth columns indicate whether there is a remainder in the problem. The concepts are sequenced form easy to difficult. Therefore, as a student progresses he should know the previous concepts to that point in the sequence.

Division - Concept by Concept

CONCEPT NO.	NUMBER OF DIGITS IN: DIVISOR	DIVIDEND	QUOTIENT	REMAINDER YES	NO
1	1	1	1		X
2	1	2	2		X
3	1	2	1		X
4	1	3	3		X
5	1	3	2		X
6	1	4	4		X
7	1	4	3		X
8	2	2	1		X
9	2	3	2		X
10	2	3	1		X
11	2	4	3		X
12	2	4	2		X
13	3	3	1		X
14	3	4	2		X
15	3	4	1		X
16	1	1	1	X	
17	1	2	2	X	
18	1	2	1	X	
19	1	3	3	X	
20	1	3	2	X	
21	1	4	4	X	
22	1	4	3	X	
23	2	2	1	X	
24	2	3	2	X	
25	2	3	1	X	
26	2	4	3	X	
27	2	4	2	X	
28	3	3	1	X	
29	3	4	2	X	
30	3	4	1	X	